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An F-16 Community Pushed to the Limit:  
Can They Handle Adding Combat Search and Rescue (CSAR)?

by

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## **PREFACE**

I chose to research and write about the F-16 and CSAR integration because it hits close to home in relation to my work on a regular basis. I am an F-16 Operational Test and Evaluation Instructor Pilot in the 422d Test and Evaluation Squadron at Nellis AFB who was involved in the recent testing to develop CSAR tactics for the F-16C fighter platform. This topic will dramatically affect the squadrons around the world, and if the A-10 is ever retired with the expectation that the F-16C and F-15E community take over the requirement for CSAR operations, it is important that the Air Force have a solid plan that allows those steps to take place without crippling our current and future capabilities in other areas, and I wanted to contribute my thoughts, as well as the expertise of the tacticians in the F-16C and A-10 communities that know their missions best, and how that would affect the Combat Air Force (CAF) in the future.

I would like to extend gratitude to my peers who assisted in the development of my paper, along with the superb guidance received by my instructor, Dr. Richard Smith. Without their assistance, this paper would not have developed into the product it is today. Most importantly, I would like to thank my lovely wife, and my family for their patience and support as I worked my way through this program, culminating with this thesis paper. Without their support, I have no doubt this paper would not have been what it is.

# **ABSTRACT**

There have been many changes to the way the US Air Force and other Services operate and new plans are being developed for the way forward on a regular basis. There has been much discussion regarding retirement of the A-10, which fulfills a Combat Search and Rescue (CSAR) role along with Close Air Support (CAS). The question remains, how does the Air Force integrate CSAR into the F-16C community without significant impacts to their current capabilities? A problem/solution methodology was used throughout this paper to determine the most feasible course of action by presenting multiple alternatives and comparing them to a set of criteria that highlight the pros and cons related to each specific alternative.

Through research and interviews, it was understood that there is a heavy burden that has been placed on the F-16C community with the large number of missions they are required to train to and be prepared to execute. Adding to that requirement, especially when referring to such a complicated mission set like CSAR, could be extremely detrimental to the effectiveness of the F-16C community. Key factors when determining the best course of action include training requirements, upgrade timelines, rescue vehicles (traditionally helicopters), airspace, and deployment requirements. Multiple alternatives are presented and after analyzing the above criteria, the conclusion most likely to allow integration of this new mission set without dramatically diminishing current capabilities is to dedicate three to four Reserve or Guard squadrons to CAS and CSAR similar to the way the A-10 community is currently structured.

## SECTION I: INTRODUCTION

The A-10 Warthog has long been a vital asset to the United States Air Force, as well as other Services, for its roles in Combat Search and Rescue (CSAR) and Close Air Support (CAS). Unfortunately, there are many looming fiscal constraints the Air Force is facing in the near future with the procurement of the F-35 Lightning II and other programs that have forced the Air Force to look at the A-10 as a possible solution to both financial and manning requirements and burdens. The specific statement in the fiscal year 2016 budget proposal said that the retirement of the A-10 would begin in 2016 “...to focus available funding on more urgent combatant commander requirements.”<sup>1</sup> This does not mean that the A-10 would be removed from operations immediately, but rather phased out of any combat deployments by the end of 2019.<sup>2</sup> This presents several issues that have are being addressed at the highest levels of Congress and the US Air Force.

The primary argument against A-10 retirement by Congress is the lack of a similar CAS platform to replace their capabilities. Although the Air Force has several platforms that perform CAS, to include the F-16, F-15E, B-1, B-52 and others, the ability to fly ‘low and slow’ with a substantial on-station time and a large load-out of weapons to employ against enemy forces is unmatched by any other platform. Senate Armed Services Committee Chairman Senator John McCain has said “We all know this is the best platform [for close-air support], there’s no doubt about that. We’re talking about the lives of men and women serving in harm’s way.”<sup>3</sup> The F-35 is ultimately the replacement for multiple platforms, to include the A-10 and F-16. This research focuses on is the specific interest in a replacement for the A-10 in the CSAR mission set in the future.

The A-10 has trained to the CSAR mission for decades and uses that skillset to rescue Isolated Personnel (IP) in the event of any US forces are downed in enemy territory. If the Air Force is successful in retiring the A-10, there will need to be a viable replacement to that airframe for CSAR to prevent any gap in that capability. There have already been a number of steps taken to ensure there is not a gap in mission capabilities by conducting testing to develop tactics in other aircraft. Ultimately, the decision was made that the CSAR replacement will be a joint effort between two airframes, the F-16C and the F-15E.<sup>4</sup> This is particularly concerning for the F-16 community as there are already a large number of mission sets that they are currently responsible for maintaining proficiency in.<sup>5</sup> This concern brings about a very important question, if the F-16 becomes the next CSAR platform, how does the Air Force need to reorganize their mission sets to ensure future success?

To answer that question, several factors must be considered, to include the assets required to establish a solid training program, the amount of training required to upgrade aircrews to accomplish this mission, the experience required to become proficient and prepared to execute, any loss of proficiency in current capabilities or loss of capability completely, and deployment requirements associated with the requirement for CSAR assets in a particular Area of Responsibility (AOR). There are several long-term issues that will be generated by introducing such an important and time consuming mission into a community that many already argue is overloaded with requirements. There was a paper written by Major David Auston, an F-16 Operational Test and Evaluation (OT&E) pilot, which discussed how the F-16 community is not currently performing to the required level to ensure mission success in the missions they already train to and are expected to perform in the event of a large scale war.<sup>6</sup>



## **Methodology**

This research will address multiple possible alternatives that could provide a possible solution to the many problems that are created by integrating this mission set into the F-16 community. It is vitally important that a feasible long-term solution be selected to ensure combat lethality in future conflicts. A short term decision could forever diminish the F-16's ability to have proficient fighter pilots that are capable of upholding the requirements necessary to facilitate the most lethal fighting force possible. A range of alternatives will be presented from removing the Sandy role from the fighter force completely to incorporating a merger between active duty fighter squadrons and Guard or Reserve counterparts. To provide the most feasible alternative in a recommendation, each possible solution will be evaluated using multiple criteria that are most important when determining a particular alternative's validity. This analysis will range from aircrew training requirements to areas of proficiency that will be lost or diminished, to include possible deployment requirements now and in the future.

## **SECTION II: BACKGROUND**

As stated by JP3-50, Personnel Recovery, "CSAR is the operational capability that enables USAF rescue forces to respond effectively across the range of military operations."<sup>7</sup> The A-10 has been the primary Rescue Mission Commander (RMC) and Sandy platform for Personnel Recovery (PR) for decades. A-10 pilots typically operate as a 4-ship when executing these tactics and do so under the Sandy 1-4 call signs. This mission is one that takes years of experience to master and be truly prepared for in the event of real-world execution.<sup>8</sup> With the A-10 at risk of being forcibly retired to make funds and personnel available for other resources, it is critically important that there be a replacement platform to operate in the PR environment.

Headquarters (HQ) Air Combat Command (ACC) previously recognized this issue and took the appropriate steps to ensure tactics were developed for the mission in different airframes.

The 422 Test and Evaluation Squadron (422 TES) was tasked with conducting testing for the F-16 Viper and F-15E Strike Eagle to determine viability of each of the platforms capabilities to conduct the CSAR mission set.<sup>9</sup> The 422 TES is an Operational Test (OT) squadron comprised of all six Model Design Series (MDS) aircraft, the A/OA-10, F-15C, F-15E, F-16CM and F-22A, making it the most diverse squadron in the Air Force.<sup>10</sup> The squadron's primary mission is to execute operational test and evaluation for hardware, software, and weapons upgrades prior to their release to the Combat Air Force (CAF).<sup>11</sup> Throughout this test, experts in the A-10 division who are current and qualified instructor pilots in the CSAR mission set at the 422 TES operated as instructors for both the F-16 and F-15E divisions to develop airframe specific tactics.<sup>12</sup> Once tactics have been developed, a plan must be in place to bring this capability to the CAF.

This research will address the issues related to integrating the CSAR mission set into F-16 squadrons Designed Operational Capabilities (DOC) memorandums (or statements as they are often referred to) of each CAF unit. This DOC statement defines the mission sets that the aircrew must train to or be proficient in/familiar with in the event of war. Based on those requirements, Ready Aircrew Program (RAP) Tasking Memorandums (RTMs) are written and distributed to all CAF units that outline training program requirements for the upcoming fiscal year.<sup>13</sup> These are typically specific to airframes, or in the case of the F-16, specific to block type. For example, there is a RTM for F-16 Block 40 units and a separate one for Block 50 units. Block 40 units are typically responsible for missions related to air-to-ground tactics such as Close Air Support, Interdiction and Surface Attack Tactics. Block 50 units are typically more

responsible for air-to-air tactics such as Offensive and Defensive Counter Air, Suppression of Enemy Air Defenses (SEAD) and Air Interdiction (AI).<sup>14</sup> This is not to say that each unit does not train on some level to the other mission sets, but more emphasis is placed on assigned missions for each particular unit. In order to understand the implications associated with this transition, it must first be understood what CSAR requires of aircraft and aircrew.

### **CSAR Task Force Construct**

A typical CSAR Task Force (CSARTF) that is used as a baseline training force for the A-10 community is comprised of A-10s (operating under the call sign of Sandy), a Rescue Vehicle (RV), Command and Control (C2), SEAD and Strike Assets.<sup>15</sup> Maintaining a force that allows for recovery of IPs in hostile territory is vitally important to the warfighter and the government. The mantra of “Never Leave a Man Behind” is one that has been important to military personnel throughout the distinguished history of the United States military. To prevent the unnecessary loss of American forces, this task force is vital to that end. Ultimately, the role of the A-10 in CSAR is to locate Isolated Personnel and escort Rescue Vehicles (RVs) (also known as RESCORT) in to the area for recovery. Traditionally, the HH-60G Pave Hawk is the RV expected to be used in a majority of scenarios.

An article from [www.military.com](http://www.military.com) stated that “...the HH-60G Pave Hawk is the U.S. Air Force’s primary combat search and rescue helicopter used by Air Force special tactics teams and pararescuemen.”<sup>16</sup> This aircraft is a version of the Army Black Hawk helicopter that has been modified to meet the needs of the Air Force.<sup>17</sup> The locations of these assets are important when considering the capability to train fighter aircrew to escort a rescue vehicle into a particular AOR. Other assets that can be used to train to this mission that would be reasonably expected to rescue an IP that Air Force aircrews could train with would be the CV-22 Osprey, the UH-1

Huey, or the CH-47 Chinook. In executing this mission, it is important to understand the basic roles of each member of a CSARTF.

## **Sandy Pilot Roles and Responsibilities**

As the RMC and Sandy 1 (flight lead), primary responsibilities include mission planning, managing the scenario (training or real-world) and executing with the CSARTF. He/she is the member ultimately responsible for the success or failure of the PR event. This participant's primary responsibility while airborne is to establish contact with the survivor, authenticate the individual to ensure they are actually the IP the CSARTF is searching for, and develop the route and game plan for extraction of the asset, all while formulating a plan for protection of the task force. Traditionally, Sandy 1 focuses initially on getting an accurate location of the IP to formulate his/her execution plan for the CSARTF. According to JP3-50, Personnel Recovery, "accurate and reliable location coordinates and the ability to communicate those coordinates between the force elements in a secure manner are necessary to ensure proper support to, and recovery of, isolated personnel."<sup>18</sup> This position is typically reserved for the most senior instructor pilots (IP) or the Weapons Officers at the squadron and wing levels.<sup>19</sup>

Sandy 2 is traditionally a Forward Air Controller – Airborne (FAC-A) qualified pilot who is used as a relay between Sandy 1 and all other forces while coordinating de-confliction of weapons employment. They are responsible for controlling all weapons employment by all players both along the route that is established by Sandy 1 for the RV and the rescue escort (RESCORT) assets and in the vicinity of the IP. This position is critically important to CSARTF and IP safety, and having the FAC-A qualification as Sandy 2 is extremely important to having the experience and knowledge to execute under such circumstances.<sup>20</sup> Of note, there are a limited number of FAC-A qualified F-16 pilots throughout the CAF, the majority of which are

located in Block 40 F-16C squadrons due to the nature of their mission assignments.<sup>21</sup> During the execution phase of a recovery, Sandy 1 and 2 take over the RESCORT role at the time of mission execution for the final IP pickup with the RV, but up to that point Sandy 3 and 4 are focused on the RV.<sup>22</sup>

Sandy 3 and 4 are the pilots responsible for RESCORT of the RV throughout the majority of the ingress to the objective location. JP3-50, Personnel Recovery, states that “RESCORT aircraft require voice and data communications capability to/from the isolated person, other RESCORT aircraft, and the recovery vehicle/aerial delivery vehicle/RTs.”<sup>23</sup> Without keeping the RV safe, there will be no rescue and most RV’s are only capable of defending themselves to a very short distance compared to surface-to-air threats in most theaters of operation now and in the future. A significant amount of training and experience is required for these roles as it is a very dynamic mission that requires both aircrews to maintain visual of the RV (typically two helicopters/rescue vehicles) and execute reconnaissance on the route while executing attacks.<sup>24</sup> They are carrying multiple forward-firing ordinances, to include rockets, bullets, AGM-65 Mavericks, as well as precision guided munitions (PGMs) to attack any factors to the CSARTF and specifically to the RV along the route of flight assigned by Sandy 1.<sup>25</sup>

The major consideration associated with the four different roles of the A-10 pilots as Sandy aircrew is the amount of time and experience required to fulfill each of the individual responsibilities during execution of a real-world rescue operation. A typical timeline in the A-10 community for a pilot to go from non-qualified as a Sandy to begin the upgrade, and ultimately become a Sandy 1 is dependent on individual capabilities and experience and is usually four years of total time.<sup>26</sup> That being considered, and the fact that the A-10 community really only has two focused mission sets, CAS and CSAR, it is clear that there is a significant experience

requirement to ensure the aircrew are ready and capable of executing this mission. With that consideration, is the F-16 community in a position to absorb this mission?

## **Current State of the F-16 Community**

In its initial design, the F-16 was intended to be a day-only, Visual Flight Rules (VFR) dog-fighting aircraft. From this aircraft's inception to now, there have been dramatic improvements to its capabilities and multiple changes to mission requirements that aircrews are now expected to execute to. There have been numerous enhancements to the aircraft that now allow it to be a day/night, all weather, air, land and sea capable fighter. Those enhancements include a Common Configuration Implementation Program (CCIP), which allowed the F-16 to take on many of the previously mentioned missions. The F-16CM has now become one of the most desirable aircraft for any given theater based on sheer numbers and the multi-role capability. The continual deployment of these aircraft with the required aircrews over the past 14+ years has arguably greatly diminished the ability for pilots to train to their current assigned mission requirements and maintain the appropriate level of proficiency.<sup>27</sup>

When evaluating operations tempos for F-16 units across the CAF, there are constantly units deployed to multiple locations throughout the year. Squadrons are continuously supporting operations to include Operation Inherent Resolve (currently from multiple locations), Operation New Dawn (previously Operation Iraqi Freedom), and Operation Freedom's Sentinel (previously Operation Enduring Freedom). Several F-16 units were also previously supporting Operation Odyssey Dawn/Unified Protector as recently as 2011.<sup>28</sup> These continuous deployments focusing primarily on Close Air Support suggests that F-16 units are failing to maintain the level of training required to be considered proficient in many of their primary mission sets with over six months in a year dedicated to CAS training and execution. The mission requirements for F-16

units are divided into primary and secondary missions and further defined separately for Block 50 units and Block 40 units. Block 50 units are primarily responsible for air-to-air missions to include Offensive Counterair-SEAD (OCA-SEAD), Defensive Counterair (DCA), and OCA-Escort (OCA-ESC).<sup>29</sup> Block 40 units are primarily responsible for Air Interdiction/Offensive Counter Air-Attack Operations (AI/OCA-AO), Defensive Counterair (DCA) and Close Air Support (CAS).<sup>30</sup> This does not seem overly tasking but there are a number of secondary missions and basic skills that aircrews must train to annually as well.

Secondary missions for Block 50 units include Air Expeditionary Force (AEF) Preparation missions, Red Air (units have to provide their own adversary training aids for any air-to-air missions unless on a temporary duty (TDY) to another location), Air Interdiction/Offensive Counterair-Attack Operations (AI/OCA-AO), CAS, and Counter FAC/FIAC (CFF).<sup>31</sup> Block 40 units are required to train to AEF Preparation missions, Red Air, FAC(A), and Counter Fast Attack Craft/Fast Inshore Attack Craft (Counter FAC/FIAC (CFF)).<sup>32</sup> This does not include any of the basic training skills missions both types of units are supposed to train to and fly. These include tactical intercepts (TI), Basic Surface Attack (BSA), Basic Fighter Maneuvers (BFM), Advanced Combat Maneuvers (ACM), Advanced Handling Characteristics (AHC), and Instruments.<sup>33</sup> The Commander of Air Combat Command (COMACC) directs that "...squadron commanders should develop unit training programs that focus on their primary and secondary missions in accordance with the priorities as established in [the RAP Tasking Memorandum]."<sup>34</sup> Each of these missions and basic skills that aircrews must train to require sorties specifically dedicated to each mission set separately.

Furthermore, Tables 3 and 4 show that there are a minimum number of training sorties required by each pilot overall, and then for each specific mission/skillset. These are broken

down by sorties required by experienced and inexperienced pilots to maintain what is known as a Combat Mission Ready (CMR) status. This is the identifier to determine whether or not a pilot is currently ready for combat operations on a monthly basis. The F-16CM RAP Tasking Memorandums break down these requirements for the Regular Air Force (or active duty), Air Force Reserve Command (AFRC), and the Air National Guard (ANG). Table 1 depicts the number of sorties required for each of the previously mentioned organizations and individuals. The numbers in this table reflect flying hours assigned to each squadron based on each squadrons flying hour allocation driven by the budget for the Air Force, as a dollar amount can be assigned to a flying hour for a particular airframe.<sup>35</sup> Look-back requirements are inconsequential to this research and can be disregarded. Those figures (depicted in Table 1) merely describe the number of sorties required to maintain CMR currency over a one, three or twelve month period (total sortie count during that time).

Table 1. FY2015 12 month RAP sortie requirements

RAP Sortie Requirements		
ORG	Cycle	CMR Sorties Inexp/Exp
Reg AF	12 Month	108/96
	3-Month Lookback	27/24
	1-Month Lookback	9/8
AFRC	12 Month	120/72
	3-Month Lookback	30/18
	1-Month Lookback	10/6
ANG	12 Month	92/68
	3-Month Lookback	23/17
	1-Month Lookback	8/6

*Reprinted from "F-16 Blk 25-42 Ready Aircrew Program (RAP) Tasking Memorandum, Aviation Schedule 2015." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 10 1, 2014.*



It is important to understand that the numbers for sortie requirements for FY2015 have been reduced in recent years based on budget reductions and flying hour allocations also being reduced.<sup>36</sup> Table 2 shows a sample of the active duty Air Force annual flying sortie minimum numbers based on a RAP Tasking Memorandum published for FY2009. The highlight of this information is that annual sortie requirements have been reduced by 12 for both inexperienced and experienced pilots between then and now.

Table 2. FY2009 12 month RAP sortie requirements

RAP Sortie Requirements		
ORG	Cycle	CMR Sorties Inexp/Exp
Reg AF	12 Month	120/108
	3-Month Lookback	30/27
	1-Month Lookback	10/9

*Reprinted from* ACC/A3T, HQ. "ACC F-16 Block 50/52 Ready Aircrew Program (RAP) Tasking AS-10, Change 1." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 2009.

This reduction in flying sorties is an indication that pilot proficiency is not likely to increase to previously expected levels as this reduces the amount of training each individual receives in each mission set. Combine that with the operational tempo of squadrons across the CAF, including the amount of sorties required to prepare for Counter-Insurgency (COIN) CAS operations being executed in almost all current operations and other permissive environments, and then training issues begin to arise. All of that deployment preparation and training further detracts from the numerous other mission sets requiring training flights to maintain proficiency in that are unrelated to CAS and it is unlikely proficiency is being maintained in those areas.

It might seem that 108 sorties are significant, averaging roughly nine sorties per month. It must be considered, however, that each sortie averages between 1.0-1.5 hours of flight time,

which restricts the amount of training to a single basic skills training sortie or mission for any particular flight.<sup>37</sup> Tables 3 and 4 show specific requirements that are further quantified in the RAP tasking message for both Block 50s and Block 40s. Of note, the only missions that require a large number of training sorties are the primary missions that require proficiency in those areas. Secondary missions are limited as they require the pilot to be familiar with the missions but not proficient. Proficiency is defined in the RAP Tasking Memorandums as “Squadron members have a thorough knowledge of mission area but occasionally may make an error of omission or commission. Aircrew are able to operate in a complex, fluid environment and are able to handle most contingencies and unusual circumstances. Proficient aircrew are prepared for mission taskings on the first sortie in theater.”<sup>38</sup> Familiarity is defined as “Aircrew have a basic knowledge of mission area and may make errors of omission or commission. Aircrew are able to operate in a permissive environment and are able to handle some basic contingencies and unusual circumstances. Familiar aircrew may need additional training prior to first mission tasking.”<sup>39</sup> Basic skills (all requiring proficiency) are also limited in numbers. Comparing these numbers to those from the 2009 RAP Tasking Memorandum, Block 50 units were not training to Counter FAC/FIAC, Tactical Intercepts (TI) or AI/OCA-AO, with more sorties (120 for inexperienced) authorized through the Flying Hour Program (FHP) to train to a small number of mission requirements making them more proficient at each tasking.<sup>40</sup>

Table 3. Block 50 flight mission/sortie requirements.

MISSION	TASK ID	CMR (INEXP/EXP)		
		RegAF	AFRC	ANG
PRIMARY MISSIONS (PROFICIENT)				
OCA-SEAD <sup>a</sup> (day/night)	SR29/SR30	27/25	27/17	22/15
DCA <sup>b</sup> (day/night)	SR21/SR22	10/10	10/6	8/5
OCA-ESC <sup>c</sup>	SR08	8/8	8/6	8/6
SECONDARY MISSIONS (FAM)				
CC Option/ AEF Prep <sup>d</sup>	SR53	6/6	19/6	5/5

Red Air <sup>e</sup>	SR26	14/14	14/14	14/14
AI/OCA-AO <sup>f</sup> (day/night)	SR72/SR73	4/3	4/3	4/3
CAS <sup>g</sup> (day/night)	SR18/SR19	4/3	4/3	4/3
Counter FAC/FIAC (CFF) <sup>h</sup> (day/night)	SR45/SR46	4/3	4/3	4/3
<b>BASIC SKILLS (PROFICIENT)</b>				
TI <sup>i</sup>	SR63	3/2	3/2	3/2
BSA <sup>j</sup>	SR17	6/4	6/2	6/2
BSA (night)	SR33	2/2	2/2	2/2
BFM <sup>k</sup>	SR16	7/5	7/4	6/4
ACM <sup>l</sup>	SR15	7/5	6/4	6/4
AHC <sup>m</sup>	SX10	2/2	2/( )	( )
INSTRUMENT	SX08	4/4	4/( )	( )
<b>TOTAL RAP</b>		<b>108/96</b>	<b>120/72</b>	<b>92/68</b>

Reprinted from "F-16CM Blk 50/52 Ready Aircrew Program (RAP) Tasking Memorandum, Aviation Schedule 2015,." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 10 1, 2014.

*Note:* These numbers indicate the number of sorties required annually for inexperienced and experienced pilots in the Regular AF, AFRC and ANG.

<sup>a</sup> Offensive counterair-Suppression of enemy air defenses

<sup>b</sup> Defensive counterair

<sup>c</sup> Offensive counterair-escort

<sup>d</sup> Commander's option – this allows commanders to allocate these additional sortie counts to sorties of his choice. Air Expeditionary Force

<sup>e</sup> Sorties dedicated to flying as enemy aircraft, typically used as training aids for primary and secondary missions.

<sup>f</sup> Air interdiction/Offensive counterair-Attack operations

<sup>g</sup> Close air support

<sup>h</sup> Counter Fast Attack Craft/Fast Inshore Attack Craft (formerly Maritime Air Support)

<sup>i</sup> Tactical intercepts

<sup>j</sup> Basic surface attack

<sup>k</sup> Basic fighter maneuvers

<sup>l</sup> Advanced combat maneuvers

<sup>m</sup> Advanced handling characteristics

Table 4. Block 25-42 flight mission/sortie requirements

MISSION	TASK ID	CMR (INEXP/EXP)		
		RegAF	AFRC	ANG
PRIMARY MISSIONS				
AI/OCA-AO (day/night)	SR72/SR73	26/23	27/18	22/15
DCA (day/night)	SR21/SR22	10/10	10/8	10/8
CAS (day/night)	SR18/SR19	12/12	12/7	10/7
SECONDARY MISSIONS				

CC Option/ AEF Prep	SR53	6/6	17/8	6/6
Red Air	SR26	12/12	12/12	12/12
FAC (A) <sup>a</sup> (day/night)	SR23/SR24	4/3	4/2	4/2
Counter FAC/FIAC (CFF) (day/night)	SR45/SR46	4/3	4/2	4/2
<b>BASIC SKILLS</b>				
TI	SR63	3/2	3/2	3/2
BSA	SR17	8/6	8/4	8/5
BSA (night)	SR33	2/2	2/2	2/2
BFM	SR16	8/6	8/4	6/4
ACM	SR15	7/5	7/3	5/3
AHC	SX10	2/2	2/( )	( )
INSTRUMENT	SX08	4/4	4/( )	( )
<b>TOTAL RAP</b>		<b>108/96</b>	<b>120/72</b>	<b>92/68</b>

*Reprinted from "F-16 Blk 25-42 Ready Aircrew Program (RAP) Tasking Memorandum, Aviation Schedule 2015." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 10 1, 2014.*

*Note:* These numbers indicate the number of sorties required annually for inexperienced and experienced pilots in the Regular AF, AFRC and ANG in individual mission sets or basic skills training sorties.

<sup>a</sup> Forward air controller (Airborne)

To better understand the sortie counts in Tables 3 and 4 and what they mean, a breakdown of the main focus of each F-16 unit type is required. F-16CM Block 50 unit's number one mission set is Suppression of Enemy Air Defense (SEAD), a vital role in any major conflict with surface-to-air missile (SAM) systems as a layer of defense in enemy territory. The objective of this mission is to allow a level of freedom of movement for friendly forces in non-permissive environments with a typical F-16 weapons load-out of air-to-air missiles and AGM-88 HARMs (High-speed Anti-Radiation Missiles) used to target SAM system radars via their HARM Targeting System (HTS) Pod.<sup>41</sup> These F-16s are used to escort and protect other air assets to locations where they typically execute some form of air-to-ground weapons employment. Reference any recent conflict that involves SAM systems in scenario, to include recent operations in Libya or Syria, and Block 50 units were involved based on their SEAD capability. Current locations of these squadrons include Shaw Air Force Base (AFB), Spangdahlem Air Base (AB), Germany, and Misawa AB, Japan.<sup>42</sup>

Block 40 unit's number one mission set is AI/OCA-AO, which is traditionally called Opposed Surface Attack Tactics (OpSAT) by pilots in these squadrons. The premise of this mission set is to fly into a defended environment with a mixed load out of air-to-air and air-to-ground weapons to face enemy aircraft, eliminate those threats (self-escort), and employ air-to-ground weapons against assigned targets.<sup>43</sup> Combat coded F-16 Block 40 aircraft are based at Hill AFB, Aviano AB, Italy, Kunsan AB and Osan AB, both in South Korea. Kunsan and Osan AB's are in place solely for protection of South Korea and do not traditionally deploy to any other locations.<sup>44</sup> Hill AFB currently hosts two F-16 squadrons, both of which will be shut down, likely in the coming years, to make room for the F-35 Lightning II aircraft.<sup>45</sup> That will leave just over 50 F-16 Block 40 aircraft at Hill AFB that are possibly going to be moved to Guard and Reserve units that currently fly the A-10 in the event that airframe is retired.<sup>46</sup> These units include two Reserve squadrons located at Davis-Monthan AFB in Tucson, AZ and Whiteman AFB, MO, as well as an Air National Guard squadron located in Fort Wayne, IN.<sup>47</sup> This will leave no US based Block 40 combat units and only one overseas (Aviano AB) that is not dedicated to Korea's protection. There are other Block 40 units that are stationed in the United States for initial Basic Course (B-course) training that do not participate in combat operations. The operational tempo (ops tempo) of all combat F-16 squadrons has created stress on their ability to prepare for combat scenarios involving their primary mission sets as well.<sup>48</sup>

With AEF deployments creating high ops tempos for squadrons detracting from training to all required mission sets coincident with reduced authorized flight hours and an increase in assigned mission requirements, F-16 aircrews are arguably not currently capable of performing to the expected/required level of proficiency in the event of a large-scale or high-threat wartime scenario. Any additions to the current requirements, such as CSAR, could severely hamper any

squadron's ability to adequately train to all mission requirements.<sup>49</sup> Unless there were significant shifts in the construct of each unit's DOC statements with subsequent changes to the RAP Tasking Memorandums for any block aircraft that are assigned the CSAR mission, how will the F-16 absorb this complicated mission set, and what must they sacrifice to do so? A major consideration is how A-10 pilots currently train to the CSAR mission and the time required gaining proficiency and experience in that role.

## **A-10 Training Requirements**

The A-10, currently the Air Force's primary CSAR RESCORT platform, is allocated the same number of training sorties as the F-16 for both experienced and inexperienced pilots (reference Table 1) on an annual basis as stated in their RAP Tasking Memorandum for FY 15.<sup>50</sup> Their primary mission sets are extremely limited and include CAS, FAC (A), and CSAR.<sup>51</sup> One reason they are held in such high regard by ground forces for their CAS capability (FAC (A) being included in that mission set) is due to the amount of training they dedicate to that mission and simply the airframe's specific designed capabilities.<sup>52</sup> Their secondary mission sets include Counter FAC/FIAC, AI, and Commander (CC) Option sorties.<sup>53</sup> Basic skills sets that require training are Basic Surface Attack (BSA), Surface Attack Tactics (SAT), BFM, ACM, AHC, and instruments, which are comparable to those missions and basic skills seen in the F-16's message.<sup>54</sup> As seen in Table 5, the majority of their training missions or basic skills are dedicated to CAS or CSAR-related execution. Very little time or effort is spent on anything else, which allows them to become extremely proficient at both mission sets. Through an understanding of a typical syllabus and seasoned weapons officer's expertise, one can gain insight into the requirements to become a Sandy qualified pilot.

Table 5. A-10 Flight Mission/Sortie Requirements

MISSION	TASK ID	CMR (INEXP/EXP)		
		REGAF	AFRC	ANG
PRIMARY MISSIONS				
CAS Day	SR18	16/14	16/12	15/13
CAS Night	SR19	6/5	6/3	5/3
FAC(A) Day (If Qualified)	SR23	12/10	12/6	6/6
FAC(A) Night (If Qualified)	SR24	4/3	4/2	2/2
CSAR (If Qualified)	SR07	12/10	12/6	6/6
SECONDARY MISSIONS				
Counter FAC/FIAC (CFF)	SR45	6/5	6/4	3/2
Air Interdiction (AI)	SR72	6/5	6/4	2/2
CC OPTION	SR53	14/16	20/20	25/14
BASIC SKILLS				
BSA Day	SR17	6/6	8/5	11/8
BSA Night	SR33	4/2	4/3	5/4
SAT Day	SR27	6/6	( )/( )	( )/( )
SAT Night	SR28	2/2	( )/( )	( )/( )
BFM	SR16	5/4	6/4	7/5
ACM	SR15	3/2	4/3	5/3
AHC Sortie	SX10	2/2	2/( )	( )
Instrument Sortie	SX08	4/4	2/( )	( )
TOTAL RAP		108/96	108/72	92/68

*Reprinted from ACC/A3T, HQ. "ACC F-16 Block 50/52 Ready Aircrew Program (RAP) Tasking AS-10, Change 1." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 2009.*

In addition to the A-10's dedication to a small number of mission sets, significant emphasis is placed on the Sandy upgrades and training as well. A typical squadron upgrade through the Sandy program consists of approximately 4.5 hours of academics on CSAR and specific roles of each flight member.<sup>55</sup> There are typically seven upgrade sorties required to get from Sandy 4 to Sandy 1 in accordance with the syllabus.<sup>56</sup> That syllabus is further defined by allocating one or two flights for each Sandy position. What is not depicted in the syllabus is the amount of experience required to earn entry into the upgrade for each of the four Sandy flight roles. The Sandy 4 upgrade is traditionally conducted during a young wingman's Mission Qualification Training (MQT) program as they arrive on station.<sup>57</sup> To enter into the Sandy 3

upgrade, that requires at least a flight lead status (roughly two years of experience), while Sandy 1 and 2 upgrades are typically reserved for the most seasoned and capable instructors and Weapons Officers.<sup>58</sup> The overall timeline to create a Sandy 1 pilot is generally four or more years.<sup>59</sup> This is dramatic considering that the typical F-16 assignment is 2 years 8 months (CONUS assignments) or 3 years (OCONUS assignments) and there is not currently a CSAR structure in F-16 DOC statements. An A-10 pilot's ability to upgrade depends on his/her skills in the CSAR mission set, which requires significant training and experience gained by years of focusing on a narrow set of missions. Aside from the experience levels required to earn the title of Sandy 1, there are assets required to ensure adequate training to this mission set.

### **Assets Necessary for Adequate CSAR Training**

There are several CSAR platforms and personnel that could potentially be tasked with this mission but the assets used in execution of the CSAR mission with RESCORT platforms (currently the A-10) are typically HH-60G Pave Hawks or CV-22 Ospreys.<sup>60</sup> Part-task training can be conducted without these assets with the sole use of a flight of F-16s or A-10s where pilots train to particular tasks related to a PR mission without executing a full-scale scenario with RVs. Those forces must be integrated with RV assets to understand the pace of operations, realistic actions and expectations from RV aircrews, and for integration training so the RV aircrews understand how the A-10 currently operates, or how the F-16 would operate, and the flight contracts that would be used between each of the assets in the scenario.<sup>61</sup>

There are numerous resources necessary to facilitate proper training of aircrew involved in CSAR training missions. The most critical of these assets are airspace and RV support. There must be airspace that allows for realistic horizontal and vertical ranges of operations for a PR event, to include altitudes down to the surface for RV operations and the ability to conduct



simulated or actual weapons employment.<sup>62</sup> Additionally, having the ability to replicate surface-to-air threats is also important, whether that be real-world emitters on training ranges, or simulations. RV support is equally important to ensure realistic RESCORT training by F-16 aircrews and their RV counterparts. As stated in JP3-50, Personnel Recovery, “Fixed- or rotary-wing aircraft assigned RESCORT responsibilities should be capable of providing the recovery vehicles with reconnaissance, suppressive fire support, and, if possible, communications relay.”<sup>63</sup> Understanding the self-support capabilities of RVs, and the requirements to protect them in specific scenarios can only be understood by training with those assets on a regular basis to be adequately prepared for actual PR events.<sup>64</sup>

### **SECTION III: CSAR INTEGRATION ALTERNATIVES**

There are a relatively limited number of alternative solutions to the question regarding how the Air Force should integrate the CSAR mission into F-16 unit’s DOC memorandums. In the active duty combat coded F-16 community, there is soon to be only one F-16 wing in the United States and four wings across the globe, all requiring constant training to be prepared for any number of the mission sets mentioned in Section II. The research conducted included several discussions with tactical experts from both Block 40 and Block 50 backgrounds, all of which have more CSAR experience in the F-16 than any other pilot in the Air Force at this time.<sup>65</sup> These individuals were the ones who developed F-16 CSAR tactics with the A-10 test division in the 422 TES while gaining an understanding for the requirements associated with training to and adopting this mission. Additionally, they developed a draft syllabus for the community to work from if ever tasked with this requirement. There is no source that has a better understanding of the details related to this mission set and how it could affect the F-16 community.

## **All F-16 Active Duty Units Integrate CSAR Mission**

The most simplistic answer to CSAR integration is to task all F-16 squadrons with the requirement to train and maintain proficiency in this mission. One of the most notable training differences between Block 40s and Block 50s is the SEAD mission that is executed by the Block 50 units. A pilot transitioning to the Block 50 from a Block 40 requires significant training to develop SEAD skill sets.<sup>66</sup> All other skill sets in both block aircraft are trained to by both block aircraft to some extent and a transition between the two blocks by a single pilot is not difficult aside from the SEAD mission set.<sup>67</sup> If CSAR was adopted by all F-16 units, it would ease the burden of a multi-year upgrade to ultimately become a Sandy 1 qualified instructor pilot prior to a Permanent Change of Station (PCS).<sup>68</sup> A pilot who has been qualified as a Sandy 2 after almost three years of experience in one squadron could PCS to a new location and continue building experience to eventually upgrade to a Sandy 1 qualified pilot. This would provide a much more proficient CSAR force as it relates to the Sandy mission through continuity in training. Additionally, F-16s are deployed to support every major operation today whose presence (assuming CSAR qualified) would allow for quicker recovery times and reduced additional deployment requirements to have CSAR forces available in the event that PR recovery is required. This would, however, require a reduction in the ability to train to other mission sets across the F-16 community.

Tables 3 and 4 document the number of training sorties required in primary and secondary mission sets annually (OCA-SEAD (Block 50) and AI/OCA-AO (Block 40)). Primary mission sets would suffer the most as they currently require over 25 sorties a year per pilot to maintain proficiency.<sup>69</sup> A-10 pilots currently require 12 training flights per year for CSAR, along with FAC(A) requirements and a large number of CAS sorties.<sup>70</sup> Establishing

CSAR as a primary mission for all F-16 units would greatly detract from the overall tactical employment capabilities of pilots across the CAF as a large number of training sorties in areas that are necessary for basic skills development and other primary mission requirements would be lost. Changing the entire focus of the F-16 community would severely hamper the ability to be proficient in any mission, detracting from their unique capability to execute SEAD and opposed interdiction, and may truly become the aircraft some call the “jack of all trades, master of none.”

### **Block 50 Squadrons Add CSAR to DOC Statements**

The Block 50 F-16 is currently the most desired type of F-16 in every AOR based on the ability to conduct and execute the SEAD mission. The looming threat of SAM systems in the vicinity of every AOR is a concern to all aircraft operating, especially in Syria, on a daily basis.<sup>71</sup> SEAD assets that have the capability to execute in a high threat environment while conducting CAS and interdiction style operations is a very unique capability, and makes the F-16 a valuable asset in all theaters. Constantly training to such a dynamic mission set would possibly allow for pilots to integrate the CSAR mission into their training plans based on current training and execution habit patterns. The CSAR mission requires constant situational assessments and modifications to execution game plans for the CSARTF to facilitate IP recovery. That being said, what capabilities can the Air Force afford to lose from F-16 squadrons if they were tasked with this requirement?

If these units (currently in South Carolina, Germany, and Japan) integrated CSAR into their DOC statements, they would lose their ability to execute the SEAD mission effectively and with proficiency.<sup>72</sup> The SEAD mission requires significant experience to execute and these units are already hindered by the inability to train against a realistic threat environment, requiring even more time preparing for simulated missions against artificial threats.<sup>73</sup> Additionally, these units

have a secondary mission of CAS but have to dedicate a large number of sorties to CAS training for each deployment spin-up to prepare for the mission currently executed in every AOR.<sup>74</sup> This is a regular occurrence as Block 50 units across the globe are being deployed on a regular rotational basis to support multiple operations that do not directly require any SEAD capability at all. Block 50 units are also missing a critically important skillset for the Sandy 2 role as well, Forward Air Controller-Airborne (FAC (A)). There is no current requirement to maintain any FAC (A) qualified pilots in these units and no sorties allocated to train to that skillset, further burdening these units and detracting from their SEAD capability if tasked with CSAR. FAC (A) trained pilots spend much of their time and effort better understanding a CAS environment, which would further detract from their SEAD capabilities.<sup>75</sup> On the contrary, how would the Block 40 be able to integrate this mission set?

### **Block 40 Squadrons Add CSAR to DOC Statements**

Unlike the Block 50, Block 40 units train to CAS as a primary mission set and also maintain FAC (A) qualified pilots in their squadrons.<sup>76</sup> Although CSAR is not directly related to the CAS mission, which diverges when analyzing execution of each mission, it does lend itself to similar skillsets related to air-to-ground weapons employment. CAS is much more scripted, traditionally requires Joint Terminal Attack Controllers (JTACs) embedded with ground units they support, and does not involve many CSAR related tactics, radio relay requirements, or communication with C2 in the same fashion.<sup>77</sup> In current operations, primary mission sets of the Block 40 other than CAS, such as AI-OCA-AO and DCA, are not required in any current operation. The only recent operation involving AI-OCA-AO was Operation Odyssey Dawn/Unified Protector in Libyan support.<sup>78</sup> Reducing the number of training sorties of Block 40 mission sets to make room for CSAR would not create nearly as great of an impact on other

capabilities as air-to-ground weapons employment would still be the highlight of their capabilities.

On the other hand, planning a change of this magnitude cannot be viewed in a shortsighted manner, but rather how it will effect operations in the F-16 for the next several decades before its retirement (Service Life Extension Program (SLEP) dependent). Although DCA and AI/OCA-AO are not currently being utilized in operations, they will likely be necessary skillsets in future conflicts against a more robust adversary, or in fighting enemies that support areas we are in conflict with. An example of this is North Korea and the potential to fight both North Korea and its allies, such as China. Furthermore, the only two squadrons in the United States, currently located at Hill AFB, are closing.<sup>79</sup> The only wing hosting Block 40 F-16s that is not dedicated to protection of South Korea is located at Aviano, AB. This would only allow two squadrons in the Block 40 community to implement CSAR training, likely insufficient for CSAR deployment requirements. Additionally, Aviano AB does not have airspace that allows low-altitude training and is constantly considered for operations in areas near Italian land mass, as it is the closest fighter base to most locations of interest in the Middle Eastern region.<sup>80</sup> Another pressing consideration in assigning CSAR to Block 40s or Block 50s would be continuity and training issues over a longer time period. If it takes as much as four years to upgrade only the most experienced pilots to the Sandy 1 qualification and assignments for F-16 pilots are currently between 2 years 8 months (US based assignments) and 3 years (overseas assignments), there could be a significant gap in the ability to adequately train the appropriate number of Sandy 1 pilots and keep them qualified if they are transitioning to and from Block 50 units. Training requirements could be managed if pilots were assigned to one location for a longer period of time though, as is the case with most Guard and Reserve units.

## **Dedicated Guard/Reserve Units for the CSAR Mission**

The Guard and Reserve community has been an exceptional resource to our armed forces at home and abroad, especially over the last decade. Deployment cycles have increased to support multiple operations and every unit has a phenomenal amount of talent, as many of the pilots were previously active duty.<sup>81</sup> As mentioned in Section II, there are three units (one Guard and two Reserve units) that currently fly the A-10 that will possibly acquire the 50+ F-16 aircraft from Hill AFB as they shut down those units if the A-10 is retired.<sup>82</sup> These units have a plethora of knowledge on CSAR as experienced A-10 operators and if the Air Force were to transition these units to the F-16, they would be extremely well prepared to execute CSAR in the F-16 aircraft once they developed experience in basic operations and modified CSAR and employment tactics in the airframe.<sup>83</sup> Additionally, these squadrons could be dedicated platforms to the CSAR mission without other conflicting training requirements like active duty squadrons would have. Being able to focus solely on CSAR and CAS would produce pilots that are currently comparable to those pilots training in this manner in the A-10 right now, producing extremely effective units to execute these missions. The structure of a Reserve or Guard squadron is different than the active duty, however.

Unlike the active duty, Guard and Reserve units are composed of both fulltime and part-time pilots, and part-time pilots often have a second career.<sup>84</sup> Assigning CSAR to these units would come with a deployment obligation in many operations, as having CSAR forces in AORs the United States is operating in is vitally important to ensure personnel recovery in a timely manner. An example of this is the recent deployment of CSAR forces (not including A-10s) to Turkey for Operation Inherent Resolve. That deployment tempo could reduce the ability to retain aviators in a force that is already struggling due to major airline hires and other issues.<sup>85</sup>

Additionally, Guard units are controlled at the state level rather than at the federal level. This would mean potential complications politically regarding deployment tempos for any guard units that train to and execute this mission. Another option would be to eliminate fighter platforms from the CSARTF.

## **Eliminate CSAR from the Fighter Aircraft Force**

There are recovery scenarios that have not required the A-10 airframe to facilitate CSAR events but this is all dependent on the resources available, hostiles in the vicinity of the IP and time allowed for pick up or bed down. Bed down is a scenario that prevents immediate rescue of an IP and they must find a location to avoid enemy contact or discovery to allow our forces the time required to facilitate recovery in the future. An example of this is during Operation Odyssey Dawn/Unified Protector. During a mission with two F-15Es, one of their aircraft crashed and the aircrew (a pilot and Weapons System Officer (WSO)) were separated.<sup>86</sup> The WSO was being protected by multiple Air Force aircraft to include A-10s, F-16s, and F-15Es but the pilot's location was unknown at the time. Ultimately, the pilot was rescued by a Marine CV-22 Osprey with no support from A-10 aircraft.<sup>87</sup> The WSO was rescued via non-traditional means. This does not mean that the A-10 CSAR mission is not required or obsolete, but rather that there are a number of factors that must align in order to allow for such a mission to take place.

Another example of Sandy forces not being employed is our current fight in Operation Inherent Resolve. The Air Force recently deployed CSAR forces to Turkey in support of operations in Syria.<sup>88</sup> Those forces include several HH-60G Pave Hawk rescue helicopters and HC-130s. Defense Department spokeswoman Laura Seal stated that these assets "...will be on station to provide rescue capabilities to coalition recovery efforts in the fight against ISIL."<sup>89</sup>

The operating environment in Syria is permissive, or in other words, there is no significant threat to friendly aircraft from surface-to-air missile threats at this time.<sup>90</sup> Due to the nature of this environment, these rescue assets would be capable of operating in this location without the requirement for Sandy forces. It is crucial that recovery assets are available in the event that there are any aircraft lost for a rapid recovery of coalition forces. Despite the lack of Sandy forces in the theater in this example, if there is a downed aircraft, there would be an On-Scene Commander (OSC), likely from a fighter platform, who would make contact with the IP after on the ground and begin facilitating information passage for recovery.<sup>91</sup> As stated in the JP3-50, Personnel Recovery, “Ideally, an isolated person would be under direct friendly visual contact from the time of the isolating event until recovered.”<sup>92</sup> It is unlikely that the aircrews on station who would take the OSC role are Sandy qualified pilots. There are several other methods of searching for the IP in the event the OSC does not make contact with the IP. Search methods “including electronic, ground force reconnaissance, and/or visual search methods specifically tailored for each isolation incident.”<sup>93</sup>

Ultimately, there are a number of methods available for personnel recovery from all services, each with its own specific mission designation and assets. JP 3-50 states that a Personnel Recovery Task Force (PRTF), also known as a CSARTF in the Air Force “...is a cohesive, interoperable force that may consist of any variety of dissimilar aircraft, ground vehicles, or maritime vessels” that is capable of its own force protection.<sup>94</sup> This includes a variety of assets that are not restricted to the current A-10 platform operating as Sandy. In reality, the aircraft normally assigned to perform PR operations are the HH-60G and HC-130P/N, HC-130J, or MC-130P (ANG only).<sup>95</sup> Additionally, there are dedicated ground force



assets designated to support PR, referred to as the GUARDIAN ANGEL weapons system, composed of combat rescue officers (CROs) and pararescuemen.<sup>96</sup>

On the contrary, if there is a PR event taking place behind enemy lines that requires RESCORT for the RV and communications links via aircraft, the A-10 is a vital asset. The intent is to have both air and land recovery assets dedicated to PR, allowing other aircraft that have some form of PR capability to focus on their primary missions while rescuing the IP.<sup>97</sup> JP 3-50 states that "...aircrews performing the role of RESCORT significantly increase the chances of successful recovery operations."<sup>98</sup> There are countless scenarios that would prevent GUARDIAN ANGEL forces or other non-traditional means of recovery from having the ability to reach the IP in high threat, rapid response scenarios. Only with the ability to provide RESCORT for the RV and provide a clear avenue of approach free of enemy aircraft and other threats to the RV will the recovery be successful. Otherwise, there will likely be a prolonged bed down requirement by the IP to find a safe location to wait for a long-term recovery plan to take place, contingent upon safe passage by relatively defenseless aircraft without dedicating other aircraft to a PR package that are not primary CSAR platforms, detracting from their primary missions in a particular AOR. Even with a Sandy flight executing this mission, there could be times that require additional assets for support to include SEAD for potential SAM threats, additional OCA aircraft to protect against enemy air forces, along with strikers for any additional ground threat neutralization. PR events were recently integrated into a Red Flag Operational Exercise at Nellis AFB, where qualified F-16 Sandy pilots from the 422 TES executed CSAR with HH-60's during Large Force Engagements (LFE) in high threat environments.<sup>99</sup> Had it not been for the protection of the RV in those scenarios by a dedicated RESCORT flight, it would undoubtedly have been mission failure during those training missions.<sup>100</sup>

## **SECTION IV: CRITERIA FOR SELECTING AN ALTERNATIVE**

Criteria for evaluating the most logical course of action were developed based on the expected impact to F-16 units if they adopt the CSAR mission set. Alternatives were compared to develop a recommendation for the way forward if the A-10 eventually retires. While CSAR is a very important mission set, consideration must be given to the current capabilities of the F-16 through the missions squadrons currently execute, training required to execute, proficiency required to be successful in those missions, and the deployment tempo currently required by the F-16 community, as well as CSAR forces.

### **Pilot Training Requirements**

Training requirements for each block aircraft of the F-16 and A-10 aircrews has been highlighted in sections II and III in detail. Comparing the training requirements of the A-10 and its primary missions of CSAR and CAS to that of the two F-16 blocks shows that to adequately train forces for the CSAR mission, it would require a significant loss in capabilities from missions where they are currently trained. It is not reasonable to assume that the active duty F-16 community (Block 40 or Block 50) could adopt the CSAR mission set and continue to operate at the required level in mission sets like SEAD and AI/OCA-AO. On the contrary, if Reserve or Guard units are receiving new F-16s with pilots who currently fly the A-10, it is feasible to consider dedicating their training and preparation to CSAR and CAS, as the A-10 currently trains in their airframe.

## **Rescue Asset Availability**

One of the biggest limitations in tasking F-16 units with CSAR is the availability of rescue assets to train with for training. The only co-located HH-60 helicopters and F-16s are at Nellis AFB, NV and Eglin AFB, FL.<sup>101</sup> Both of these locations have F-16s used for Developmental and Operational Test (DT and OT), but do not have any combat units permanently stationed there. Nellis AFB has the advantage of Red Flag exercises multiple times per year that would allow exceptional training between aircrew from each airframe that are not regularly stationed together. There are multiple HH-60 units that are also in the Guard and Reserves, but none of those units are co-located with F-16 units either. It is likely that CV-22 units will be relocated to Spangdahlem AB, Germany in the near future, but that is the sole location of Block 50 units in the European region. Regardless of the squadrons assigned to train to the CSAR mission, significant consideration must be given to reallocating assets to facilitate the appropriate training between F-16 units and the rescue vehicles that would likely support a CSAR mission.

## **Loss of Proficiency in Current Capabilities across F-16 Squadrons**

Experience and proficiency in a skill set or mission-type are arguably more valuable than anything else when executing complicated missions that involve the possible loss of life of either friendly or enemy forces. With the previously mentioned reduction in annual sorties required and the significant breadth of missions that require study and training, there would be a noticeable and significant loss of capability by the pilots who are required to be prepared for their mission requirements. Suppression of Enemy Air Defenses (SEAD) is arguably the most important mission for the F-16, and is certainly the most unique. Many have even lobbied to shift the focus of Block 40 units to align with those of Block 50s so their primary mission is

SEAD for all F-16 squadrons.<sup>102</sup> There are several other platforms that could be used for other interdiction-style missions, to include F-15E, B1 and B52, AOR dependent, but no other platform can execute the SEAD mission as the F-16 does at this time.<sup>103</sup> Each alternative must be evaluated against the training and proficiency that would be lost. Another criterion that must be assessed is deployment requirements.

### **Deployment Requirements for CSAR Squadrons**

The capability provided by the presence of CSAR forces in any AOR is extremely important. That may be any one of the numbers of assets used across all the Services, but a plan must be in place to recover isolated personnel no matter where operations are taking place. In a high threat location where aircraft are not able to operate in a permissive environment, having Sandy assets in theater for a planned or reactive recovery scenario could be critical to a successful or unsuccessful recovery of the individual(s). In certain operations, this could require a regular deployment cycle to maintain a Sandy presence in the event of any PR events. Squadrons that are assigned the CSAR mission would require appropriate preparation and training to respond to any requirement for Sandy in a given theater of operations. The US military as a whole is ultimately responsible for taking all means necessary to ensure best possible chances of safe recovery of downed personnel behind enemy lines.

## **SECTION V: RESULTS AND ANALYSIS**

In comparison of the possible alternatives against the criteria discussed in Section IV, there are stark similarities between many of the alternatives presented. When comparing the training requirements and loss in proficiency of pilots, shifting the CSAR mission to the Block 40 or 50 units would create a scenario that could cripple the current capabilities aircrew train so

hard to on a regular basis. Missions across the spectrum of combat, from air-to-air to air-to-ground, that pilots train to would suffer greatly. Block 50 units would have to train to SEAD and CSAR, creating a large training gap that would directly affect their SEAD capability. Block 40 units incorporating CSAR would have the smallest impact for other mission capabilities, but there are so few units now that it would be impossible to maintain enough pilots ready for deployments across the globe. The continuation training for aircrew who would possibly transition from one block to another would make it difficult to keep enough current and qualified Sandy 1 pilots. If all squadrons integrated CSAR, it would alleviate that issue, but would turn the F-16 community into one that no longer upholds the requirements for an effective SEAD platform, but rather the new CSAR platform. On the contrary, shifting this mission requirement to the Guard or Reserves could allow a shift in individual squadrons RAP Tasking memorandum and DOC statements to dedicate individual squadrons across the country to this mission. Any reduction in current capabilities could be offset by the gain in F-16 aircraft that will soon be divested from the two squadrons at Hill AFB that are scheduled to shut down.

There is no simple answer to the current issues related to rescue vehicle integrated training with any of the possible alternatives as no rescue vehicles are currently co-located with any F-16 units. This would not be an issue if the Sandy mission were dissolved and was no longer a mission requirement for fighter-type aircraft, which is a possible alternative to the possible retirement of the A-10. Otherwise, there is a need to develop regularly schedule TDYs to integrate fighter and rescue platforms, or shift the location of particular squadrons and support functions to a location that provides the appropriate airspace and facilities to house all required squadrons and aircraft for training. Although platform integration is extremely important to

training aircrew for CSAR execution, how deployments would be structured is another challenge.

Deployment tempo and strategy to ensure assets are in the appropriate theater for recoveries requires a long-term vision of possible operations. If all F-16 squadrons were CSAR qualified, a deployment cycle similar to what currently takes place would be feasible. There are currently constant rotations of Block 40 and Block 50 squadrons to support several operations. Block 40 units alone (based on the number of units to remain) would not allow for a sustainable deployment tempo. The primary Block 40 unit to remain is at Aviano AB, Italy, which is a strategic location for fighter assets overseas. Dedicating their training to CSAR would reduce their ability to respond in that region of the world in other roles. If Block 50s units were the primary CSAR operators, there are enough squadrons to facilitate regular deployment cycles based on the current deployment tempo, but other problems could possibly arise, to include retention of aircrew required to deploy so regularly. Guard or Reserve units assigned the role of CSAR would not be in a position to keep a constant deployment rotation but would be able to augment other squadrons that are deploying to support operations. An example of this is to have perhaps roughly three to four squadrons dedicated to the mission who, on a rotational basis, deploy four to six pilots to augment a deployment by active duty squadrons. In the current environment, those pilots would be able to support regular operations in combat, as well as retain the ability to execute as Standby pilots in the event of a recovery requirement.

## **SECTION VI: CONCLUSIONS AND RECOMMENDATIONS**

Integration of the CSAR mission set into any set of units is a complicated one; it is one that creates ripple effects throughout the F-16 community. There are both short-term and long-term areas to consider regarding many of the previously discussed factors to ensure the Air Force remains the most combat capable in the world. The F-16 makes up the largest number of fighters in the inventory, so careful consideration must be given to how this mission is integrated in the event that the A-10 is retired. The intent of this research was to highlight the significance of this implementation, to ensure that the decisions made regarding this topic are not taken lightly and that any decision made is decided with careful consideration to how it will impact the entire community.

When all alternatives are considered with the criteria defined by this research, it is recommended that if the F-16 community adopts the CSAR mission, that the Air Force dedicate between three and four Reserve and/or Guard squadrons to adopt the mission, focusing their training on only CSAR and CAS as the A-10s have done. With the anticipation that Reserve and Guard units would acquire over 50 F-16s from Hill AFB, this would alleviate the risk of reducing capabilities of the current F-16 force while allowing the future Sandy mission to continue without hindrance. Additionally, if those units currently flying A-10s can acquire the F-16s that will soon be available as the Air Force closes the two F-16 squadrons at Hill AFB, that would provide squadrons complete with several years of CSAR experience that could be molded to fit the tactics developed for the F-16. Three to four squadrons would also allow for a manageable deployment tempo as squadrons could simply augment active duty units already deploying to theaters of operation, rather than having to deploy an entire squadron.

Despite the many challenges associated with adopting yet another mission in an age where flying hours are reduced and additional duties for aviators is increasing, this alternative

would allow integration of the mission without degrading the F-16's current capabilities. Pilots joining these Reserve or Guard units would understand the commitment they were making to their fellow warfighter and to this country, and they could focus on the training necessary to develop skill sets that would allow for successful execution in future endeavors. The combat capabilities the Air Force provides to any operation are impressive, and it must be a priority to maintain a force that allows for quick and effective recovery forces in times necessary during conflicts.<sup>104</sup>

## NOTES

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<sup>1</sup> Everstine, Brian. *Air Force Times*. February 2, 2015. <http://www.airforcetimes.com/story/military/2015/02/02/air-force-a10-retirement-2016-budget/22743569/>.

<sup>2</sup> Everstine.

<sup>3</sup> Everstine.

<sup>4</sup> Clark, Major Matthew, interview by Captain Michael Conrad. 422 TES F-16 Division Commander, F-16 Operational Test and Evaluation Pilot/Sandy 1 (09 16, 2015).

<sup>5</sup> Baer, Maj. Jay, interview by Capt. Michael Conrad. (08 10, 2015).

<sup>6</sup> Auston, Major David. *The Effects of High Operational Tempo on the Block 50 F-16 Community*. Graduate Research Project, Embry-Riddle Aeronautical University, 2011.

<sup>7</sup> "JP 3-50, Personnel Recovery." Joint Publication, Chairman of the Joint Chiefs of Staff, 2011., F-1.

<sup>8</sup> Wethington, Maj. Bradley, interview by Capt. Michael Conrad. A-10 Instructor Pilot/Sandy 1 (08 26, 2015).

<sup>9</sup> Baer.

<sup>10</sup> Baer.

<sup>11</sup> Eglin AFB. 53rd Wing Fact Sheet. 10 22, 2013. <http://www.eglin.af.mil/library/factsheets/factsheet.asp?id=16015> (accessed 08 12, 2015).

<sup>12</sup> Baer.

<sup>13</sup> "A-10 Ready Aircrew (RAP) Tasking Memorandum, Aviation Schedule 2015." HQ ACC/A3T, PACAF/A3T, USAFE/A3T, ACC/A3G and AFRC/A3T, 10 1, 2014. 1.

<sup>14</sup> F-16 Blk 50-52 RTM, 5.

<sup>15</sup> 23 FG A-10C Upgrade Syllabus, 73.

<sup>16</sup> HH-60G PAVE HAWK. n.d. <http://www.military.com/equipment/hh-60g-pave-hawk> (accessed 09 17, 2015).

<sup>17</sup> HH-60G, 1.

<sup>18</sup> JP 3-50, VI-6.

<sup>19</sup> Wethington.

<sup>20</sup> Wethington.

<sup>21</sup> Baer.

<sup>22</sup> Wethington.

<sup>23</sup> JP 3-50, F-3.

<sup>24</sup> Hilkert.

<sup>25</sup> Baer.

<sup>26</sup> Wethington.

<sup>27</sup> Auston, 1.



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<sup>28</sup> Clark.  
<sup>29</sup> F-16 Blk 50-52 RTM, 5.  
<sup>30</sup> F-16 Blk 25-42 RTM, 5.  
<sup>31</sup> F-16 Blk 50-52 RTM, 5.  
<sup>32</sup> F-16 Blk 25-42 RTM, 5.  
<sup>33</sup> F-16 Blk 25-42 RTM, 5.  
<sup>34</sup> F-16 Blk 50-52 RTM, 1.  
<sup>35</sup> Clark.  
<sup>36</sup> Baer.  
<sup>37</sup> Welt, Major David, interview by Captain Michael Conrad. 422 TES F-16 Operational Test and Evaluations Pilot/Sandy 1 (09 22, 2015).  
<sup>38</sup> F-16 Blk 25-42 RTM, 17.  
<sup>39</sup> F-16 Blk 25-42 RTM, 17.  
<sup>40</sup> ACC/A3T HQ, F-16 Blk 50-52 RTM 2009.  
<sup>41</sup> Clark.  
<sup>42</sup> Clark.  
<sup>43</sup> Welt.  
<sup>44</sup> Welt.  
<sup>45</sup> Baer.  
<sup>46</sup> Clark.  
<sup>47</sup> Clark.  
<sup>48</sup> Baer.  
<sup>49</sup> Clark.  
<sup>50</sup> A-10 RTM, 5.  
<sup>51</sup> A-10 RTM, 5.  
<sup>52</sup> Wethington.  
<sup>53</sup> A-10 RTM, 5.  
<sup>54</sup> A-10 RTM, 5.  
<sup>55</sup> 23 FG Instruction 11-2, 71.  
<sup>56</sup> 23 FG Instruction 11-2, 80.  
<sup>57</sup> Wethington.  
<sup>58</sup> Wethington.  
<sup>59</sup> Wethington.  
<sup>60</sup> Wethington.  
<sup>61</sup> Wethington.  
<sup>62</sup> Wethington.  
<sup>63</sup> JP 3-50, VI-19.  
<sup>64</sup> Wethington.  
<sup>65</sup> Clark.  
<sup>66</sup> Clark.  
<sup>67</sup> Clark.  
<sup>68</sup> Welt.  
<sup>69</sup> F-16 Blk 25-42 RTM, 5.  
<sup>70</sup> A-10 RTM, 5.  
<sup>71</sup> Welt.  
<sup>72</sup> Clark.  
<sup>73</sup> Clark.  
<sup>74</sup> Clark.  
<sup>75</sup> Welt.  
<sup>76</sup> F-16 Blk 25-42 RTM, 5.  
<sup>77</sup> Welt.  
<sup>78</sup> Baer.  
<sup>79</sup> Clark.  
<sup>80</sup> Baer.  
<sup>81</sup> Baer.  
<sup>82</sup> Clark.



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- <sup>83</sup> Wethington.
- <sup>84</sup> Baer.
- <sup>85</sup> Baer.
- <sup>86</sup> Harney, Maj Kenneth, interview by Capt. Michael Conrad. (08 15, 2015).
- <sup>87</sup> Harney.
- <sup>88</sup> Everstine, Brian. Air Force Magazine: Daily Report. 09 30, 2015.  
<http://www.airforcemag.com/DRArchive/Pages/2015/September%202015/September%2030%202015/CSAR-Airmen,-Aircraft-Deploy-to-Turkey.aspx> (accessed 09 30, 2015).
- <sup>89</sup> Everstine, 1.
- <sup>90</sup> Baer.
- <sup>91</sup> Clark.
- <sup>92</sup> JP 3-50, VI-6.
- <sup>93</sup> JP 3-50, VI-6.
- <sup>94</sup> JP 3-50, VI-18.
- <sup>95</sup> JP 3-50, F-3.
- <sup>96</sup> JP 3-50, F-3.
- <sup>97</sup> JP 3-50, F-3.
- <sup>98</sup> JP 3-50, F-3.
- <sup>99</sup> Baer.
- <sup>100</sup> Baer.
- <sup>101</sup> Welt.
- <sup>102</sup> Clark.
- <sup>103</sup> Clark.



## APPENDIX A: ABBREVIATIONS

422 TES: 422 Test and Evaluation Squadron  
ACC: Air Combat Command  
ACM: Advanced Combat Maneuvers  
AEF: Air Expeditionary Force  
AFB: Air Force Base  
AFRC: Air Force Reserve Command  
AI/OCA-AO: Air Interdiction/Offensive Counterair-Attack Operations  
AI: Air Interdiction  
ANG: Air National Guard  
AOR: Area of Responsibility  
BFM: Basic Fighter Maneuvers  
C2: Command and Control  
CAF: Combat Air Force  
CAS: Close Air Support  
CC: Commander  
CCIP: Common Configuration Implementation Program  
CMR: Combat Mission Ready  
COIN: Counter-Insurgency  
COMACC: Commander of Air Combat Command  
CONUS: Continental United States  
CRO: Combat Rescue Officer  
CSAR: Combat Search and Rescue  
CSARTF: Combat Search and Rescue Task Force  
DCA: Defensive Counterair  
DOC: Designed Operational Capabilities  
ESC: Escort  
FAC/FIAC: Fast Attack Craft/Fast Inshore Attack Craft  
FAC-A: Forward Air Controller – Airborne  
FHP: Flying Hour Program  
HARM: High-speed Anti-Radiation Missile  
HQ: Headquarters  
HTS: Harm Targeting System  
IP: Instructor Pilot  
JTAC: Joint Terminal Attack Controller  
LFE: Large Force Engagement  
MDS: Model Design Series  
MQT: Mission Qualification Training  
OCA: Offensive Counterair  
OCONUS: Outside Continental United States  
OpSAT: Opposed Surface Attack Tactics  
OSC: On-Scene Commander  
OT&E: Operational Test and Evaluation  
OT: Operational Test

PGM: Precision Guided Munition  
PR: Personnel Recovery  
PRTF: Personnel Recovery Task Force  
RAP: Ready Aircrew Program  
RESCORT: Rescue Escort  
RMC: Rescue Mission Commander  
RTM: Ready Aircrew Program Tasking Memorandum  
RV: Rescue Vehicle  
SAM: Surface-to-Air Missile System  
SAT: Surface Attack Tactics  
SEAD: Suppression of Enemy Air Defenses  
TDY: Temporary Duty  
TI: Tactical Intercepts  
VFR: Visual Flight Rules  
WSO: Weapons System Officer



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